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The Influence of Physical Activity and Sedentary Behaviours on Severity of COVID-19 in the Clinical Practice

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Abstract

As to COVID-19 pandemic, one of the risk factors would be physical activity. It was categorized into i) consistently inactive (0-10 min/week), ii) some activity (11-149 min/week), iii) consistently (150< min/week), and analyzed. Odds ratio (OR) of i) / iii) was hospitalization (2.26), ICU admission (1.73), death (2.49), respectively. Due to COVID-19 lockdowns, physical activity level was decreased, which showed 2000 steps daily reduction equivalent to 100 kcal. Both of sedentary behaviors and physical inactivity would be the greater risks of health outcomes, and the absence of physical activity has been the 4th cause of mortality across the world.

Keywords: COVID-19 pandemic; Physical activity; Sedentary behaviors; Moderate to vigorous physical activity (MVPA); Centers for Disease Control and Prevention (CDC)

Background

The COVID-19 pandemic has given devastating human and economic consequences. The author has continued reports concerning COVID-19 for international comparison and excess death [1]. Some cohort studies across the world have revealed that the risk may vary remarkably [2]. Formerly, elder patients with frailty represented large prevalent situation of deaths from COVID-19 [3]. However, greater risk of severe condition and death have been observed in chronic pathology, including obesity, diabetes mellitus (DM), non-communicable diseases (NCDs), atherosclerotic cardiovascular disease (ASCVD) than people with normal weight and no co-morbidities [4]. Consequently, the pandemic has brought people worldwide recognize that obesity and NCVs can be controlled in medical practice and that viewpoint of public health would be required [5]. For COVID-19 patients, hospitalization, ICU admission and mortality were compared. Cases of COVID-19 (n=48440) for 10 months were included [6]. Physical activity was categorized into three including i) consistently inactive (0-10 min/week), ii) some activity (11-149 min/week), iii) consistently (150< min/week). These data were analyzed for the involvement of inactivity. As a result, odds ratio (OR) of the value i) / iii) was hospitalization (2.26), ICU admission (1.73), death (2.49), respectively (Table 1). Similarly, OR of ii) / iii) was 1.20, 1.10, 1.32, respectively. Consequently, increased physical activity would be strongly related with decreased risk for outcomes for COVID-19 cases. Furthermore, promotion of physical activity can be prioritized by public health offices in the future. United States (US) has Centers for Disease Control and Prevention (CDC), which continued various research for COVID-19. It presented the risk factors of male, advanced age, underlying comorbidities, obesity, diabetes and cardiovascular disease [7]. However, clarified results were not found concerning efficacy of physical activity on the outcomes. As to the standard guideline, adults are recommended to have 150 min/week for moderate to vigorous physical activity (MVPA) [8,9]. It is known that immune function can recover associated with regular physical activity. As a matter of fact, people continuing regular active life have lower intensity, incidence and mortality of symptoms [10]. Regular physical activity can decrease the risk of inflammatory condition, including various pulmonary damage by COVID-19 [11].

Furthermore, physical activity brings beneficial effect on lung capacity, muscle power, cardiovascular health and mental health [12]. Since COVID-19 pandemic, education or recommendation of adequate physical activity was basically absent [13]. In addition to insufficient activity level in pre-pandemic period, current activity indicates unintended results of decreasing the level even more [14]. In fact, there was a significant decrease of physical activity after the lifestyle-changes by COVID-19 pandemic [15]. From previous studies, those who consistently meet the physical activity guideline showed decreased odds for severe COVID-19. Compared with people who are always inactive, those who meet the guideline showed lower odds of hospitalization, ICU admission or dying from COVID-19. According to this evidence, physical inactivity can be a modifiable strong risk factor. Consequently, continuing regular physical activity can become important action to prevent infection and its complications related with COVID-19. A study of COVID-19 was for 6 months was reported in United Kingdom (UK). The cases included 1781 cases, in which the outcome showed 1195 admission, 152 ICU admission and 400 deaths [16]. The results showed the identified risk factors including male, ethnicity (Asian or Black), age (>50). Obesity, T2DM and CKD have elevated hospitalization risk. Obesity contributed higher risk of ICU admission. Underlying CKD, dementia and stroke have elevated death risk. As to COVID-19 lockdowns, the decreased chances of physical activity were studied in four countries (UK, US, France and Australia) [17]. Online survey (n=2541) was conducted in April-June of 2020. As a result, a reduction of 2000 steps per day, which is equivalent to non-expenditure of 100 kcal. The COVID-19 pandemic has dominated every aspect of the world for more than a year. Medical services have been influenced remarkably, with prioritization of COVID-19 patients and delays of other cases [18]. People of vulnerable diseases have elevated risk of exacerbation of previous illnesses and developing NCDs. For DM, hypertension, NCDs and ASCVD are most prevalent pathology with elevated mortality and severity of COVID-19. Furthermore, some factors are important such as obesity, higher BMI, advancing age, frailty, sarcopenia and other impaired situation [19]. Especially, elderly patients tend to worse their condition during persistent pandemic. For the pandemic more than 1 year, lots of people in the world tend to move less for several reasons, and to have sedentarism and physical inactivity. The absence of physical activity has been the 4th cause of mortality across the world. Furthermore, it contributes poor mental and physical health outcomes, in addition to crucial economic and social burden to each country. From public health point of view, sedentary behaviors bring several simultaneous influences [20]. Both of sedentary behaviors and physical inactivity would be the greater risks of health outcomes. These two entities are mutually related for their frequency, duration, intensity, modality and context of practice [21]. Unhealthy lifestyles including physical inactivity and unfavorable dietary habits will apparently increase the risk for obesity and overweight. It will bring poor cardiometabolic fitness and health leading to NCD situations and infectious pathology [22]. Inadequate physical activity has become independent risk factor for several preventable lifestyle-related diseases. They include T2DM, obesity, overweight, hypertension, dyslipidemia, ASCVD, which become comorbidities along with severe status of COVID-19 [23] (Table 1).

Table 1: *Risk factors of severity of COVID-19.*

			Odds Ratio of the risk	
		admit	ICU adm	death
Age	<60	-	-	-
	60-69	2.30	2.40	4.01
	70-79	3.72	3.44	10.40
	80≤	6.13	3.52	27.31
Sex	female	-	-	-
	male	1.85	2.38	1.72
BMI	<25.0	-	-	-
	25-29	-	-	-
	30-39	1.12	-	-
HbA1c	<7.0	-	-	-
	7.0-7.9	1.29	12.50	0.03
	8.0≤	2.20	1.91	1.64
exercise	enough	-	-	-
	less active	1.89	1.58	1.88
	inactive	2.26	1.73	2.49
The data [6].				

Conflict of Interest

The author has read and approved the final version of the manuscript. The author has no conflicts of interest to declare.

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